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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,812	07/28/2003	Stephen A. Tarin	8676-041	9035

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JONES DAY
222 EAST 41ST ST
NEW YORK, NY 10017

EXAMINER
ALAM, SHAHID AL

ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		10/629,812	TARIN, STEPHEN A.
		Examiner	Art Unit
		Shahid Al Alam	2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*21 July 2006*</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>*25-30*</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>*25-30*</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed July 21, 2006 have been fully considered but they are

not persuasive for the following reasons.

Applicant argues Schiefer does not relate to or describe the underlying structures

(instance, connectivity and cardinality) in which data in a database are stored; Schiefer

simply does not disclose a cardinality element at all; and Schiefer does not describe or

suggest updating a cardinality element each time the number of instances changes.

Examiner respectfully disagrees all of the allegations as argued. Examiner, in his

previous office action, gave detail explanation of claimed limitation and pointed out

exact locations in the cited prior art.

Examiner is entitled to give claim limitations their broadest reasonable

interpretation in light of the specification. See MPEP 2111 [R-1]

Interpretation of Claims-Broadest Reasonable Interpretation

During patent examination, the pending claims must be 'given the broadest

reasonable interpretation consistent with the specification.' Applicant always has the

opportunity to amend the claims during prosecussion and broad interpretation by the

examiner reduces the possibility that the claim, once issued, will be interpreted more

broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

In response to applicant's argument, the examiner recognizes that obviousness

can only be established by combining or **modifying the teachings of the prior art** to

produce the claimed invention where there is some teaching, suggestion, or motivation

to do so found either in the references themselves or in **the knowledge generally**

available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Instant application discloses a computer-implemented database and method providing an efficient, ordered reduced space representation of multi-dimensional data. Instances of each data value for an attribute are identified by instance elements, each of which is associated with one data value. Connectivity information is provided for each instance element that uniquely associates each instance element with a specific instance of a data value for another attribute. Logically, separate data structures provide the information needed to reconstruct the "records" in the database. They provide "instance" and "connectivity" information, where instance information identifies the instances of each value in the field that is in a record and connectivity information associates each instance with a specific instance of a value in at least one other field. The value, instance, displacement and occurrence tables have been described as "tables" having rows, columns and cells, the invention is not limited to such structures. **Any computerized data structure for storing the information in these tables may be used**. The value table stores the data values representing the user-view values of information in the database; the instance table is a specific example of an "instance store" and a "connectivity store" (i.e., it both identifies instances of data items in the value store and represents relationships among instances of data items in the value store); and the displacement table is a specific example of a "cardinality store" (i.e., it represents the frequency of occurrence of equal instances of data values).

Schiefer teaches computer systems employ a **relational database management** system or a RDBMS, which is a computer program that manages **data storage and retrieval**. The data is present within the database system in one or more tables or **relations (connectivity)**. Each **relation** consists of a number of **records or tuples** containing specific information grouped in some sequence. Each tuples (at least one) consists of one or more fields, which are called attributes. In any single attribute (at least one) of **a tuples or information** there can be only a single **value**, however, **different tuples can have different values** for the same attribute. Two kinds of statistics are typically important to proper management by the RDBMS of the database's stored relations. One is the number of tuples contained in a single relation. This value is known as the relation's cardinality and is denoted by .parallel.R.parallel., wherein R is the relation. The second is the number of distinct values taken by an attribute denoted by d.sub.a, wherein (a) is the attribute. The value of the relation's cardinality, .parallel.R.parallel., is important because it indicates the overall size of the relation. The number of distinct values, d.sub.a, is important because it is used to determine the size of the results from different operations on the relation data (column 1).

The local predicate may serve **to reduce** (to update or to modify or to change) **the cardinality of the relation** (connectivity). This reduced cardinality (modified cardinality) is called the effective cardinality of the relation. It can be used in other cardinality calculations, e.g., for estimating join result sizes. The local predicates can change the effective cardinality of the relation and the number of distinct values in the

attributes of the relation thus changing the size of the final join result (column 2, lines

41 – 56).

Schiefer's teaching of a **relational database management** system that manages

data storage and retrieval as described above clearly teaches applicant's claimed

subject matter.

For the above reasons, Examiner believed that rejection of the last Office action

was proper.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 25 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Patent Number 5,542,073 issued to Klaus Schiefer et al. ("Schiefer").

With respect to claim 25, Schiefer teaches a system for storing and retrieving

tuples (column 1, lines 18-22) comprising: a collection of a number of instances

corresponding to a value of a first attribute; a cardinality element corresponding to the

number of instances; wherein at least one instance indicates at least one other instance

corresponding to a value of a second attribute and the second attribute is different from

the first attribute (see abstract, column 2, lines 41 – 56).

Schiefer teaches that effective cardinality should be determine when the value of particular attribute changes, therefore, it would have been obvious to a person of ordinary skill in the computer art at the time the invention was to update or change or modify cardinality in order to efficiently evaluate the cost estimate to obtain the lowest execution cost (column 3, lines 21 – 32).

With respect to claim 26, Schiefer teaches a system for storing and retrieving tuples (column 1, lines 18-22) comprising: a collection of a number of instances corresponding to a value of a first attribute; a cardinality element corresponding to the number of instances; wherein the value can be derived from the cardinality element and wherein at least one instance indicates at least one other instance corresponding to a value of a second attribute and the second attribute is different from the first attribute (see abstract, column 2, lines 41 – 56 and column 8, lines 11 – 19).

As to claim 27, for at least two tuples having identical first attribute values and identical second attribute values, . . . a cardinality element, . . . attribute values (see abstract, column 1, lines 19 – 37).

As to claim 28, the instance element comprises the cardinality element (see abstract).

The subject matter of claims 29 – 30 are rejected in the analysis above in claims 25 – 28 and these claims are rejected on that basis.

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

U.S. Patent Number 5,379,422 issued to Antoshenkov.

U.S. Patent Number 5,855,019 issued to Bhargava et al.

4.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact Information

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shahid Al Alam whose telephone number is (571) 272-4030. The examiner can normally be reached on Monday-Thursday 8:00 A.M.- 4:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shahid Al Alam
Primary Examiner
Art Unit 2162

14 October 2006